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# Microsoft Press® **Computer Dictionary** Third Edition

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- **345 illustrations and diagrams**
- **Extensive Internet and Web coverage**
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**Microsoft Press**

Microsoft Press  
**Computer  
Dictionary**

Third Edition

**Microsoft Press**

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# Introduction

The *Microsoft Press Computer Dictionary, Third Edition* is designed to be a comprehensive and authoritative source of definitions for computer-related terms and abbreviations. The dictionary includes terms drawn from a wide variety of topics:

## **Applications**

- Databases
- Desktop Publishing
- Multimedia
- Spreadsheets
- Word Processing

## **Communication and Networks**

- E-mail
- Intranet

## **Data and Data Storage**

## **Games**

## **Graphics**

## **Hardware**

- Architecture
- Chips, Cards, and Boards
- Computers
- Disks, Drives, and Other Media
- Peripherals
- Processors

## **History**

## **Information Processing**

- General Computing
- Input/Output
- Memory and Memory Management

## **Internet**

- Protocols
- Security
- Tools (user and developer)
- World Wide Web

## **Organizations**

## **Software Engineering**

- Concepts
- Programming Languages
- Tools and Techniques

## **Standards**

## **Systems and Environments**

- Operating Systems





## Introduction

Although this book covers nearly every aspect of computing, it does not include entries on most companies or on most makes and models of computers, nor does it contain entries on most application software products. The few exceptions to this rule of thumb are key companies and products that have a historical or universal importance within the computing industry.

This dictionary emphasizes terminology that the average computer user will encounter in documentation, online help, computer manuals, marketing and sales materials, the popular media, and the computer trade press. Because most computer users operate personal computers and desktop systems at home, work, or both, the majority of the entries in this dictionary cover the terminology used in describing and working with these systems. However, some specialized or highly technical language is included that pertains to areas of industry, academia, software and hardware development, and research. These terms have been included because they have a bearing on more common computer terminology or because they are of historical significance.

## Changes in the Third Edition

The third edition of the *Microsoft Press Computer Dictionary* has been revised and updated to reflect the many advances in the computer field and to include several areas that have come into prominence in the public eye, such as the Internet. Over 2,500 new entries have been added, covering the Internet, the World Wide Web, network computing, hardware and software advances, virtual reality, multimedia, and work-group computing.

Existing entries from the second edition of the *Microsoft Press Computer Dictionary* have been updated to include changes in the field.

All entries have been styled in a more traditional dictionary format than in previous editions. Pronunciations and parts of speech are given for all terms. Entries that have more than one sense, or definition, are broken into numbered lists.

## Order of Presentation

Entries are alphabetized by letter. Spaces are ignored, as are characters such as hyphens and slashes; for example, *Baudot code* falls between *baud* and *baud rate*, and *machine-independent* falls between *machine identification* and *machine instruction*. Numbers and symbols are located at the beginning of the book and are listed in ascending ASCII order. If an entry begins with a letter or letters but contains a number, it is listed alphabetically, according to the initial letter(s), and then according to ASCII order. Thus, *V20* precedes *V.2x*, and both precede *VAB*.

## Entries

Entries are of two types: main entries, which contain full definitions, and synonymous cross-references, which contain *See* references to the appropriate main entries. Synonymous cross-references are generally secondary or less common ways of referring to a main entry. The definition at the main entry can be substituted as a definition for the synonymous cross-reference.

## Format

Information in each main entry is presented in a consistent format: entry name in boldface, spelling variants (if any), pronunciation, part of speech, definition, illustration or table references (if any), acronym (if any), alternative names (if any), and cross-references (if any).

## Main Entries

Entries that are acronyms or abbreviations for one or more words or concatenations of two or more words have those words spelled out at the beginning of the definition. The letters in these words or phrases that make up the acronym, abbreviation, or concatenation are in boldface.

When a main entry is spelled exactly the same as another main entry, the two entries are differentiated by the use of a superscript numeral after each

term. These entries are called homographs, and they are generally different parts of speech. For example,

e-mail<sup>1</sup> (noun)

e-mail<sup>2</sup> (verb)

## Spelling Variants

When a main entry has one or more variations in the way it is spelled, each spelling variant follows the main entry, after the word *or*.

## Pronunciations

Pronunciation keys appear after all defined terms in the dictionary. Within the pronunciation keys, individual words are separated by word spaces, and syllables within each word are separated by stress marks or hyphens.

## Variant Pronunciations

The *Microsoft Press Computer Dictionary, Third Edition* uses a generalized system for representing pronunciations, particularly for the vowels. There are many subtle variations, well known to phonologists in particular, in the ways Americans in different parts of the United States pronounce many vowels. However, most can recognize words that are pronounced slightly differently by others and should be able to interpret the broad category represented for each of the vowel sounds in this dictionary and apply it in their own regional variation or dialect. This dictionary represents only standard American pronunciations, but there are cases in which sufficient divergence in pronunciation exists, even within the United States, so some variant pronunciations have been included.

Variants are separated by commas, and the most common pronunciation may appear first. However, because there are many cases where two pronunciations are (at least roughly) equally widely used, the order in which they appear should not be interpreted to mean that the first one given is more “correct” or common than the other(s). Variants are shown on a word-by-word basis; for a multiword entry, pronunciation keys are given only for the word or words that have variant pronunciations.

For words that are spelled with the letters *wh*, the pronunciation is listed with two variants: one with a simple *w* (w) and one with the *hw* sound (hw).

Words that are spelled with either *au* or *aw* include a variant pronunciation with the letter *o* with a circumflex accent (ô), which represents the vowel sound some Americans (those who make a significant distinction between this sound and a “regular” short *o*) pronounce when they say the word *dawn*. In some parts of the country, this vowel sound is also used in words with other spellings, such as *coffee* or *talk*, but this seems to be a distinctly dialectal variation rather than a standard one. It is therefore very difficult for any individual to predict how any other might pronounce these particular words, so variants have not been included for them.

## Stress

The syllable or syllables pronounced with the heaviest, or primary, stress in a term are followed by acute accents (´); those with lighter, or secondary, stress are followed by grave accents (`). For example, in the word *computer*, the second syllable is spoken more forcefully, or with more stress, than the first and third syllables and therefore is followed in the pronunciation key by an acute accent (kəm-pyú-tər´). In the word *engineering*, the third syllable is stressed most heavily, but the first syllable is stressed more than the second or fourth, so the first syllable is followed by a grave accent, indicating secondary stress (en-jə-nē-rēng`).

## Special Characters and Diacritics

The dictionary’s pronunciation schema keeps the use of technical phonetic characters to a minimum. Instead, a system that is more familiar to most Americans represents short vowels with plain letters (a, e, i, o, u) and long vowels with overbars (ā, ē, ī, ō, ū). The ligatured *o*s represent the vowel sounds in the words *foot* (ō) and *food* (ū).

The letter *a* with an umlaut (ä) is included as an alternative to the short *o* (o). It is used when the vowel is represented orthographically by some



## Introduction

letter or combination of letters other than the letter *a*, such as *a* (as in *father*), *au* (as in *caught*), or *aw* (as in *dawn*). This is done mainly to avoid confusing the reader visually with pronunciations such as wonˈdər for the word *wander*.

One other pair of alternative characters is used to represent a single vowel sound: the schwa (ə) and a short u (u). Traditionally, the schwa has been reserved for unstressed, or reduced, vowels, but in recent years it has become much more commonly used in dictionaries to also represent the short, stressed *u*. In this dictionary, the short *u* is used only in words that are spelled with the letter *u*, and the schwa is used for all other spellings except for “syllabic *l*’s,” in which cases the vowel is dropped entirely, as in the word *little* (liˈtl).

One other diacritic used in the pronunciations is a circumflex over the letter *a* (â). This is used instead of the short *e* only in combination with the letter *r*, to represent the vowel sound heard in words such as *air*, *software*, and *very*. This is done to avoid representations such as kerˈək-tər for the word *character*, which might lead some readers to believe that the sound should be pronounced as is the *er* in the word *her*.

## Acronyms

When acronyms are pronounced as a series of sounded-out letters, capital letters are used to represent the pronunciation of the letters; for example, the pronunciation for the term *EPS* is EˈP-Sˈ, not Ēˈpē-esˈ. *Note:* Letter-by-letter pronunciations are included for all acronyms in the dictionary, even those that are pronounced as words by most people; for example, the pronunciation for the term *ASCII* includes both aˈskē and AˈS-C-I-Iˈ.

## Pronunciation Symbols

The following charts include the characters used for the pronunciations in the *Microsoft Press Computer Dictionary, Third Edition* (MPCD), the International Phonetic Alphabet (IPA) symbols to which those characters correspond, and some example words in which the letter or letters that represents each sound is underlined. No attempt has been made to repre-

sent foreign sounds as they are pronounced in their original language; only Americanized pronunciations are given for foreign words and names.

### VOWELS

MPCD	IPA	Representative Words
a	æ	<u>bat</u>
ā	e	<u>ape</u>
ā	ɑ	<u>father</u>
ô	ɔ	<u>dawn</u>
är	ɔr	<u>dart</u>
âr	ɛr	<u>hair</u>
e	ɛ	<u>let</u>
ē	i	<u>bee</u> , <u>equal</u>
ēr	ir	<u>hear</u>
i	ɪ	<u>sit</u>
ī	aɪ	<u>nice</u>
īr	aɪr	<u>wire</u>
o	ɑ	<u>hot</u>
ō	o	<u>oats</u> , <u>home</u>
ör	or	<u>corn</u>
ōō	u	<u>book</u>
ōōr	Ur	<u>tour</u>
ōō	u	<u>boot</u> , <u>rule</u>
oi	ɔɪ	<u>oil</u> , <u>boy</u>
ou	aʊ	<u>out</u>
u	ʌ	<u>cup</u>
ur	ʊ	<u>purge</u>
ə	ə	<u>about</u> , <u>item</u> , <u>edible</u> , <u>gallop</u>
ər	ər	<u>ever</u>

### CONSONANTS

MPCD	IPA	Representative Words
b	b	<u>bit</u>
ch	tʃ	<u>child</u> , <u>ratchet</u>
d	d	<u>dog</u>
f	f	<u>fill</u> , <u>phobia</u> , <u>laugh</u>
g	g	<u>gold</u> , <u>ghost</u>
h	h	<u>home</u>
j	dʒ	<u>jail</u> , <u>ledge</u>
k	k	<u>kid</u> , <u>cow</u> , <u>chrome</u>
l	l, ɫ	<u>live</u> , <u>double</u>
m	m	<u>map</u>
n	n	<u>not</u> , <u>know</u>

ng	ng, ŋ	finger, <u>si</u> ng
p	p	<u>pi</u> ne, <u>ap</u> ple
r	r	<u>ra</u> t
s	s	goon, <u>ce</u> ll
sh	ʃ	<u>sh</u> oe, <u>no</u> tion, <u>cha</u> rade
t	t	<u>te</u> st
th	θ	<u>th</u> in
dh	ð	<u>th</u> en
v	v	<u>vi</u> ne
w	w	<u>wi</u> ne
hw	ʍ	<u>wh</u> ine
y	j	<u>ye</u> t
z	z	<u>zo</u> om, <u>be</u> d <sub>s</sub>
zh	ʒ	<u>plea</u> sure, <u>colla</u> ge

### Parts of Speech

Entries are broken down into four parts of speech, in addition to prefixes, abbreviated as follows:

<i>n.</i>	noun
<i>vb.</i>	verb
<i>adj.</i>	adjective
<i>adv.</i>	adverb

### Definitions

Each of the more than 7,300 entries is written in clear, standard English. Many go beyond a simple definition to provide additional detail and to put the term in context for a typical computer user. When an entry has more than one sense or definition, the definitions are presented in a numbered list, to make it easier to distinguish the particular, sometimes subtle, variations in meaning.

### Illustration and Table References

Some entries have affiliated illustrations or tables that aid in defining the entry. In most cases, illustrations and tables appear on the same page as the entries to which they apply. In some instances, however, page layout requirements have forced them to a subsequent page. Entries with illustrations or tables usually have references at the end of the definition for an entry, in the following formats:

*See the illustration.*  
*See the table.*

### Acronyms

Some terminology in the computer field, particularly computer standards and Internet slang, can be shortened to form acronyms. Sometimes the acronym is the more common way to refer to the concept or object; in these cases, the acronym is the main entry. In other cases, the acronym is not as commonly used as the words or phrase for which it stands. In these cases, the words or phrase constitute the main entry. The acronym is given after the definition for these entries in the following format:

*Acronym:*

### Alternative Names

Some items or concepts in the computer field can be referred to by more than one name. Generally, though, one way is preferred. The preferred terminology is the main entry. Alternative names are listed after any acronyms; otherwise they are listed after the definition in the following format:

*Also called:*

### Cross-References

Cross-references are of three types: *See*, *See also*, and *Compare*. A *See* reference is used in an entry that is a synonymous cross-reference and simply points to another entry that contains the information sought. A *See also* reference points to one or more entries that contain additional or supplemental information about a topic and follows any acronyms or alternative names after the definition. A *Compare* reference points to an entry or entries that offer contrast and follows any *See also* references; otherwise it follows any acronyms or alternative names after the definition.

### Future Printings and Editions

Every effort has been made to ensure the accuracy and completeness of this book. If you find an error, think that an entry does not contain enough information, or seek an entry that does not appear in this edition, please let us know. Address your letter to:



Dictionary Editor, Microsoft Press, One Microsoft Way, Redmond, WA 98052-8302. Or send e-mail to [mSPcd@microsoft.com](mailto:mSPcd@microsoft.com).

## Online Updates

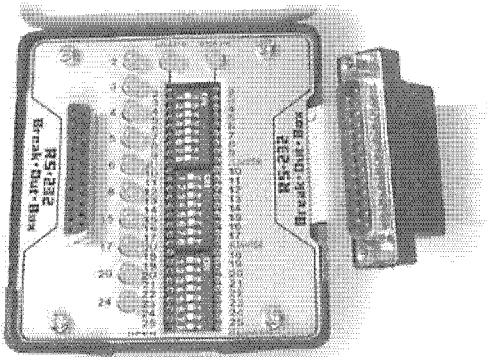
Quarterly updates and revisions will be made to the *Microsoft Press Computer Dictionary, Third Edition*, on the Microsoft Press Web site (<http://mSPress.microsoft.com>). These updates are meant to supple-

ment the content of this dictionary and keep it up to date in regard to computer technology, which is one of the fastest-evolving fields in the world today. Simply point your Web browser to <http://mSPress.microsoft.com/mSPress/products/1031> to access the update page for the dictionary. Please note that the content of the updates is in HTML format and is not available in a separate file for downloading. The updates are meant to be viewed on the Microsoft Press Web site.



On Macintosh computers, the key combination that sends a break code is Command-period.

**breakout box** \brāk'out boks\ *n.* A small hardware device that can be attached between two devices normally connected by a cable (such as a computer and a modem) to display and, if necessary, change the activity through individual wires of the cable. See the illustration.



*Breakout box.*

**breakpoint** \brāk'point\ *n.* A location in a program at which execution is halted so that a programmer can examine the program's status, the contents of variables, and so on. A breakpoint is set and used within a debugger and is usually implemented by inserting at that point some kind of jump, call, or trap instruction that transfers control to the debugger. *See also* debug, debugger.

**BRI** \B'R-I\ *n.* Acronym for **Basic Rate Interface**. An ISDN subscriber service that uses two B (64 Kbps) channels and one D (64 Kbps) channel to transmit voice, video, and data signals. *See also* ISDN.

**bridge** \brīj\ *n.* **1.** A device that connects networks using the same communications protocols so that information can be passed from one to the other. *Compare* gateway. **2.** A device that connects two local area networks, whether or not they use the same protocols. A bridge operates at the ISO/OSI data-link layer. *See also* data-link layer. *Compare* router.

**bridge router** \brīj'rou'tər, rōō'tər\ *n.* A device that supports the functions of both a bridge and router. A bridge router links two segments of a

local or wide area network, passing packets of data between the segments as necessary, and uses Level 2 addresses for routing. *Also called* Brouter. *See also* bridge (definition 2), router.

**bridgeware** \brīj'wār\ *n.* Hardware or software designed to convert application programs or data files to a form that can be used by a different computer.

**Briefcase** \brēf'kās\ *n.* A system folder in Windows 95 used for synchronizing files between two computers, usually between desktop and laptop computers. The Briefcase can be transferred to another computer via disk, cable, or network. When files are transferred back to the original computer, the Briefcase updates all files to the most recent version.

**brightness** \brīt'nās\ *n.* The perceived quality of radiance or luminosity of a visible object. Brightness is literally in the eye (and mind) of the beholder; a candle in the night appears brighter than the same candle under incandescent lights. Although its subjective value cannot be measured with physical instruments, brightness can be measured as luminance (radiant energy). The brightness component of a color is different from its color (the hue) and from the intensity of its color (the saturation). *See also* color model, HSB.

**broadband** \brod'band\ *adj.* Of or relating to communications systems in which the medium of transmission (such as a wire or fiber-optic cable) carries multiple messages at a time, each message modulated on its own carrier frequency by means of modems. Broadband communication is found in wide area networks. *Compare* baseband.

**broadband modem** \brod'band mō'dēm\ *n.* A modem for use on a broadband network. Broadband technology allows several networks to coexist on a single cable. Traffic from one network does not interfere with traffic from another, since the conversations happen on different frequencies, rather like the commercial radio system. *See also* broadband network.

**broadband network** \brod'band net'wōrk\ *n.* A local area network on which transmissions travel as radio-frequency signals over separate inbound and outbound channels. Stations on a broadband network are connected by coaxial or fiber-optic cable, which can carry data, voice, and video.

simultaneously over multiple transmission channels that are distinguished by frequency. A broadband network is capable of high-speed operation (20 megabits or more), but it is more expensive than a baseband network and can be difficult to install. Such a network is based on the same technology used by cable television (CATV). *Also called* wideband transmission. *Compare* baseband network.

**broadcast**<sup>1</sup> \brod'kast\ *adj.* Sent to more than one recipient. In communications and on networks, a broadcast message is one distributed to all stations. *See also* e-mail<sup>1</sup> (definition 1).

**broadcast**<sup>2</sup> \brod'kast\ *n.* As in radio or television, a transmission sent to more than one recipient.

**broadcast storm** \brod'kast stōrm\ *n.* A network broadcast that causes multiple hosts to respond simultaneously, overloading the network. A broadcast storm may occur when old TCP/IP routers are mixed with routers that support a new protocol. *Also called* network meltdown. *See also* communications protocol, router, TCP/IP.

**Brouter** \brou'tər, brōd'tər\ *See* bridge router.

**brownout** \broun'out\ *n.* A condition in which the electricity level is appreciably reduced for a sustained period of time. In contrast to a blackout, or total loss of power, a brownout continues the flow of electricity to all devices connected to electrical outlets, although at lower levels than the normally supplied levels (120 volts in the United States). A brownout can be extremely damaging to

sensitive electronic devices, such as computers, because the reduced and often fluctuating voltage levels can cause components to operate for extended periods of time outside the range they were designed to work in. On a computer, a brownout is characterized by a smaller, dimmer, and somewhat fluctuating display area on the monitor and potentially erratic behavior by the system unit. The only reliable means of preventing damage caused by a brownout condition is to use a battery-backed uninterruptible power supply (UPS). *See also* UPS. *Compare* blackout.

**browse** \brouz\ *vb.* To scan a database, a list of files, or the Internet, either for a particular item or for anything that seems to be of interest. Generally, browsing implies observing, rather than changing, information. In unauthorized computer hacking, browsing is a (presumably) nondestructive means of finding out about an unknown computer after illegally gaining entry.

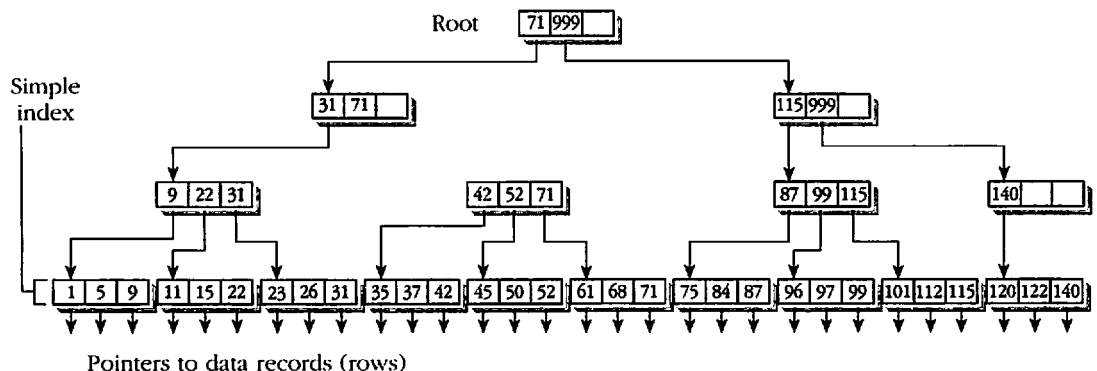
**browser** \brou'zər\ *n.* *See* Web browser.

**browser box** \brou'zər boks\ *n.* *See* Web TV.

**BRS** \B'R-S'\ *n.* *See* big red switch.

**brush** \brush\ *n.* A tool used in paint programs to sketch or fill in areas of a drawing with the color and pattern currently in use. Paint programs that offer a variety of brush shapes can produce brushstrokes of varying width and, in some cases, shadowing or calligraphic effects.

**.bs** \dot'B-S'\ *n.* On the Internet, the major geographic domain specifying that an address is located in the Bahamas.



**B-tree.** A B-tree index structure.



can operate on more than one platform. *Acronym:* DCE (D`C-E`). *See also* distributed processing.

**distributed database** \dis-tri`byōō-təd da`tə-bās\  
*n.* A database implemented on a network. The component partitions are distributed over various nodes (stations) of the network. Depending on the specific update and retrieval traffic, distributing the database can significantly enhance overall performance. *See also* partition (definition 2).

**distributed database management system** \dis-tri`byōō-təd da`tə-bās man`ej-mənt si`stəm\  
*n.* A database management system capable of managing a distributed database. *Acronym:* DDBMS (D`D-B`M-S`). *See also* distributed database.

**distributed file system** \dis-tri`byōō-təd fīl si`stəm\  
*n.* A file management system in which files may be located on multiple computers connected over a local or wide area network.

**distributed intelligence** \dis-tri`byōō-təd in-tel`ə-jəns\  
*n.* A system in which processing ability (intelligence) is distributed among multiple computers and other devices, each of which can work independently to some degree but can also communicate with the other devices to function as part of the larger system. *See also* distributed processing.

**distributed network** \dis-tri`byōō-təd net`wərk\  
*n.* A network in which processing, storage, and other functions are handled by separate units (nodes) rather than by a single main computer.

**distributed processing** \dis-tri`byōō-təd pros`es-ēng\  
*n.* A form of information processing in which work is performed by separate computers linked through a communications network. Distributed processing is usually categorized as either plain distributed processing or true distributed processing. Plain distributed processing shares the workload among computers that can communicate with one another. True distributed processing has separate computers perform different tasks in such a way that their combined work can contribute to a larger goal. The latter type of processing requires a highly structured environment that allows hardware and software to communicate, share resources, and exchange information freely.

**Distributed System Object Model** \dis-tri`byōō-təd si`stəm ob`jekt mod`əl\  
*n.* IBM's System Object Model (SOM) in a shared environment,

where binary class libraries can be shared between applications on networked computers or between applications on a given system. The Distributed System Object Model complements existing object-oriented languages by allowing SOM class libraries to be shared among applications written in different languages. *Acronym:* DSOM (D`S-O-M`). *See also* SOM (definition 1).

**distributed transaction processing** \dis-tri`byōō-təd tranz-ak`shən pros`es-ēng\  
*n.* Transaction processing that is shared by one or more computers communicating over a network. *Acronym:* DTP (D`T-P`). *See also* distributed processing, transaction processing.

**distribution list** \dis-trə-byōō`shən list\  
*n.* A list of recipients on an e-mail mailing list. This can be in the form of either a mailing list program, such as LISTSERV, or an alias in an e-mail program for all recipients of an e-mail message. *See also* alias (definition 2), LISTSERV, mailing list.

**distributive sort** \di-stri`byə-tiv sōrt\  
*n.* An ordering process in which a list is separated into parts and then reassembled in a particular order. *See also* sort algorithm. *Compare* bubble sort, insertion sort, merge sort, quicksort.

**dithering** \didh`ər-ēng\  
*n.* A technique used in computer graphics to create the illusion of varying shades of gray on a monochrome display or printer, or additional colors on a color display or printer. Dithering relies on treating areas of an image as groups of dots that are colored in different patterns. Akin to the print images called *half-tones*, dithering takes advantage of the eye's tendency to blur spots of different colors by averaging their effects and merging them into a single perceived shade or color. Depending on the ratio of black dots to white dots within a given area, the overall effect is of a particular shade of gray. Dithering is used to add realism to computer graphics and to soften jagged edges in curves and diagonal lines at low resolutions. *See the illustration. See also* aliasing, halftone.

**divergence** \di-vər`jəns\  
*n.* A moving apart or separation. On computer displays, divergence occurs when the red, green, and blue electron beams in a color monitor do not collectively light the same spot on the screen. Within a program, such as a spreadsheet, divergence can occur when



operating system and resides there for as long as the computer is on. *Compare* external command.

**internal font** \in-tər-nəl font\ *n.* A font that is already loaded in a printer's memory (ROM) when the printer is shipped. *Compare* downloadable font, font cartridge.

**internal interrupt** \in-tər-nəl in-tər-upt\ *n.* An interrupt generated by the processor itself in response to certain predefined situations, such as an attempt to divide by zero or an arithmetic value exceeding the number of bits allowed for it. *See also* interrupt. *Compare* external interrupt.

**internal memory** \in-tər-nəl mem-ər-ē\ *n.* *See* primary storage.

**internal modem** \in-tər-nəl mō-dəm\ *n.* A modem constructed on an expansion card to be installed in one of the expansion slots inside a computer. *Compare* external modem, integral modem.

**internal schema** \in-tər-nəl skē-mə\ *n.* A view of information about the physical files composing a database, including filenames, file locations, accessing methodology, and actual or potential data derivations, in a database model such as that described by ANSI/X3/SPARC, that supports a three-schema architecture. The internal schema corresponds to the schema in systems based on CODASYL/DBTG. In a distributed database, there may be a different internal schema at each location. *See also* conceptual schema, schema.

**internal sort** \in-tər-nəl sōrt\ *n.* 1. A sorting operation that takes place on files completely or largely held in memory rather than on disk during the process. 2. A sorting procedure that produces sorted subgroups of records that will be subsequently merged into one list.

**International Federation of Information Processing** \in-tər-nash-ə-nəl fed-ər-ā-shən əv in-fər-mā-shən pros-es-ēng\ *n.* *See* IFIP.

**International Organization for Standardization** \in-tər-nash-ə-nəl ōr-gə-nə-zā-shən fōr stan-dər-də-zā-shən\ *n.* *See* ISO.

**International Telecommunications Union** \in-tər-nash-ə-nəl tel-ə-kə-myōō-nə-kā-shənz yōōn-yən\ *n.* An intergovernmental organization responsible for making recommendations and standardization regarding telephone and data communications systems for public and private

telecommunication organizations. The ITU was founded in 1865 and became an agency of the United Nations in 1947. The ITU was formerly known as CCITT (Comité Consultatif International Télégraphique et Téléphonique) and changed its name to ITU in March 1993. They may be contacted at International Telecommunications Union, Information Services Department, Place des Nations, 1211 Geneva 20, Switzerland. Telephone: +41 (22) 730 5554. Fax: +41 (22) 730 5337. E-mail: helpdesk@itu.ch, teledoc@itu.arcom.ch. *Acronym:* ITU (I-T-U).

**International Telegraph and Telephone Consultative Committee** \in-tər-nash-ə-nəl tel-ə-graf and tel-ə-fōn kən-sul-tə-tiv kə-mit-ē, kən-sul-tā-tiv\ *n.* *See* CCITT.

**Internaut** \in-tər-nāt-, in-tər-nôt-\ *n.* *See* cybernaut.

**internet** \in-tər-net\ *n.* Short for internetwork. A set of computer networks that may be dissimilar and are joined together by means of gateways that handle data transfer and conversion of messages from the sending networks' protocols to those of the receiving network.

**Internet** \in-tər-net\ *n.* The worldwide collection of networks and gateways that use the TCP/IP suite of protocols to communicate with one another. At the heart of the Internet is a backbone of high-speed data communication lines between major nodes or host computers, consisting of thousands of commercial, government, educational, and other computer systems, that route data and messages. One or more Internet nodes can go off line without endangering the Internet as a whole or causing communications on the Internet to stop, because no single computer or network controls it. The genesis of the Internet was a decentralized network called ARPANET created by the Department of Defense in 1969 to facilitate communications in the event of a nuclear attack. Eventually other networks, including BITNET, Usenet, UUCP, and NSFnet, were connected to ARPANET. Currently, the Internet offers a range of services to users, such as FTP, e-mail, the World Wide Web, Usenet news, Gopher, IRC, telnet, and others. *Also called* the Net. *See also* BITNET, FTP<sup>1</sup> (definition 1), Gopher, IRC, NSFnet, telnet<sup>1</sup>, Usenet, UUCP, World Wide Web.

**Internet access** \in'tər-net ak'ses\ *n.* **1.** The capability of a user to connect to the Internet. This is generally accomplished through one of two ways. The first is through a dialing up of an Internet service provider or an online information services provider via a modem connected to the user's computer. This method is the one used by the majority of home computer users. The second way is through a dedicated line, such as a T1 carrier, that is connected to a local area network, to which, in turn, the user's computer is connected. The dedicated line solution is used by larger organizations, such as corporations, which either have their own node on the Internet or connect to an Internet service provider that is a node. A third way that is emerging is for users to use set-top boxes with their TVs. Generally, however, this will give a user access only to documents on the World-Wide Web. *See also* dedicated line (definition 1), ISP, LAN, modem, node (definition 2), set-top box. **2.** The capability of an online information service to exchange data with the Internet, such as e-mail, or to offer Internet services to users, such as newsgroups, FTP, and the World Wide Web. Most online information services offer Internet access to their users. *See also* FTP<sup>1</sup> (definition 1), online information service.

**Internet access device** \in'tər-net ak'ses də-vīs\ *n.* A communications and signal-routing mechanism, possibly incorporating usage tracking and billing features, for use in connecting multiple remote users to the Internet.

**Internet access provider** \in'tər-net ak'ses prə-vī dər\ *n.* *See* ISP.

**Internet account** \in'tər-net ə-kount\ *n.* A generic term for a registered username at an Internet Service Provider (ISP). An Internet account is accessed via username and password. Services such as dial-in PPP Internet access and e-mail are provided by ISPs to Internet account owners.

**Internet address** \in'tər-net a'dres, ə-dres\ *n.* *See* domain name address, e-mail address, IP address.

**Internet appliance** \in'tər-net ə-plī'əns\ *n.* *See* set-top box.

**Internet Architecture Board** \in'tər-net ār'kə-tek-chur bōrd\ *n.* The body of the Internet Society (ISOC) responsible for overall architectural

considerations regarding the Internet. The IAB also serves to adjudicate disputes in the standards process. *Acronym:* IAB (I'A-B'). *See also* Internet Society.

**Internet Assigned Numbers Authority** \in'tər-net ə-sīnd' num'bərz ə-thōr'ə-tē\ *n.* A unit of the Internet Architecture Board that registers and controls the assignment of various Internet-related numerical designations, such as IP port, protocol, and enterprise numbers. *Acronym:* IANA (I'A-N-A').

**Internet backbone** \in'tər-net bak'bōn\ *n.* One of several high-speed networks connecting many local and regional networks, with at least one connection point where it exchanges packets with other Internet backbones. Historically, the NSFnet (predecessor to the modern Internet) was the backbone to the entire Internet in the United States. This backbone linked the supercomputing centers that the National Science Foundation (NSF) runs. Today, different providers have their own backbones so that the backbone for the supercomputing centers is independent of backbones for commercial Internet providers such as MCI and Sprint. *See also* backbone.

**Internet broadcasting** \in'tər-net brod'ka-stēng\ *n.* Broadcasting of audio, or audio plus video, signals across the Internet. Internet broadcasting includes conventional over-the-air broadcast stations that transmit their signals into the Internet as well as Internet-only stations. Listeners use audio Internet software, such as RealAudio. One method of Internet broadcasting is MBONE. *See also* MBONE, RealAudio.

**Internet Control Message Protocol** \in'tər-net kən-trōl' mes'əj prō'tə-kol\ *n.* *See* ICMP.

**Internet Draft** \in'tər-net draft\ *n.* A document produced by the IETF (Internet Engineering Task Force) for purposes of discussing a possible change in standards that govern the Internet. An Internet Draft is subject to revision or replacement at any time; if not replaced or revised, the Internet Draft is valid for no more than six months. An Internet Draft, if accepted, may be developed into an RFC. *See also* IETF, RFC.

**Internet Engineering and Planning Group** \in'tər-net en-jə-nēr'ēng ənd plan'ēng grōp\ *n.* *See* IEPG.

**Internet Engineering Steering Group** \in'tər-net en-jə-nēr'ēng stēr'ēng grōōp\ *n.* The group within the Internet Society (ISOC) that, along with the Internet Architecture Board (IAB), reviews the standards proposed by the Internet Engineering Task Force (IETF). *Acronym:* IESG (I'E-S-G').

**Internet Engineering Task Force** \in'tər-net en-jə-nēr'ēng task' fōrs\ *n.* See IETF.

**Internet Explorer** \in'tər-net eks-plōr'ər\ *n.* Microsoft's Web browser, introduced in October 1995. Internet Explorer is now available in Windows and Macintosh versions. Later versions provide the ability to incorporate advanced design and animation features into Web pages and recognize ActiveX controls and Java applets. *See also* ActiveX controls, Java applet, Web browser.

**Internet gateway** \in'tər-net gāt'wā\ *n.* A device that provides the connection between the Internet backbone and another network, such as a LAN (local area network). Usually the device is a computer dedicated to the task or a router. The gateway generally performs protocol conversion between the Internet backbone and the network, data translation or conversion, and message handling. A gateway is considered a node on the Internet. *See also* gateway, Internet backbone, node (definition 2), router.

**Internet Group Membership Protocol** \in'tər-net grōōp' mem'bər-ship prō'tə-kol\ *n.* A protocol used by IP hosts to report their host group memberships to any immediately neighboring multicast routers. *Acronym:* IGMP (I'G-M-P').

**Internet Information Server** \in'tər-net in'fər-mā'shən sər'vər\ *n.* Microsoft's brand of Web server software, utilizing Hypertext Transfer Protocol to deliver World Wide Web documents. It incorporates various functions for security, allows for CGI programs, and also provides for Gopher and FTP servers.

**Internet Naming Service** \in'tər-net nā'mēng sər'vis\ *n.* See WINS.

**Internet Protocol** \in'tər-net prō'tə-kol\ *n.* See IP.

**Internet Protocol next generation** \in'tər-net prō'tə-kol nekst' jen-ər-ā'shən\ *n.* See IPng.

**Internet Relay Chat** \in'tər-net rē'lā chat\ *n.* See IRC.

**Internet Research Steering Group** \in'tər-net rē'sərch stēr'ēng grōōp\ *n.* The governing body

of the Internet Research Task Force (IRTF). *Acronym:* IRSG (I'R-S-G').

**Internet Research Task Force** \in'tər-net rē'sərch task' fōrs\ *n.* A volunteer organization that makes long-term recommendations concerning the Internet to the Internet Architecture Board. *Acronym:* IRTF (I'R-T-F'). *See also* Internet Society.

**Internet robot** \in'tər-net rō'bot\ *n.* See spider.

**Internet security** \in'tər-net se-kyər'ə-tē\ *n.* A broad topic dealing with all aspects of data authentication, privacy, integrity, and verification for transactions over the Internet. For example, credit card purchases made via a World Wide Web browser require attention to Internet security issues to ensure that the credit card number is not intercepted by an intruder or copied from the server where the number is stored, and to verify that the credit card number is actually sent by the person who claims to be sending it.

**Internet Server Application Programming Interface** \in'tər-net sər-vər a-plə-kā'shən prō'gram-ēng in'tər-fās\ *n.* See ISAPI.

**Internet service provider** \in'tər-net sər'vəs prə-vī dər\ *n.* See ISP.

**Internet Society** \in'tər-net sə-sī'ə-tē\ *n.* An international organization, comprising individuals, companies, foundations, and government agencies, that promotes the use, maintenance, and development of the Internet. The Internet Architecture Board (IAB) is a body within the Internet Society. In addition, the Internet Society publishes the *Internet Society News* and produces the annual INET conference. *Acronym:* ISOC (I'sok, I'S-O-C'). *See also* INET (definition 2), Internet Architecture Board.

**Internet Software Consortium** \in'tər-net soft'wār kən-sōr'shē-əm, kən-sōr'shəm\ *n.* A nonprofit organization that develops software that is available for free, via the World Wide Web or FTP, as well as development of Internet standards such as the Dynamic Host Configuration Protocol (DHCP). *See also* DHCP.

**Internet Talk Radio** \in'tər-net tāk rā'dē-ō\ *n.* Audio programs similar to radio broadcasts but distributed over the Internet in the form of files that can be downloaded via FTP. Internet Talk Radio programs, prepared at the National Press Building in Washington, D.C., are 30 minutes to 1 hour in length; a 30-minute program requires

tion, ion-deposition printers tend to produce thick, slightly fuzzy characters; the technology is also more expensive than that of a laser printer. *See also* electrophotographic printers, nonimpact printer, page printer. *Compare* laser printer, LCD printer, LED printer.

**I/O port** \I-O' pōrt\ *n.* *See* input/output port.

**I/O processor** \I-O' pros'es-ər\ *n.* *See* input/output processor.

**IO.SYS** \I'ō-sis', I-O'dot-S-Y-S'\ *n.* One of two hidden system files installed on an MS-DOS startup disk. IO.SYS in IBM releases of MS-DOS (called IBMBIO.COM) contains device drivers for peripherals such as the display, keyboard, floppy disk drive, hard disk drive, serial port, and real-time clock. *See also* MSDOS.SYS.

**IP** \I-P'\ *n.* Acronym for **Internet Protocol**. The protocol within TCP/IP that governs the breakup of data messages into packets, the routing of the packets from sender to destination network and station, and the reassembly of the packets into the original data messages at the destination. IP corresponds to the network layer in the ISO/OSI model. *See also* ISO/OSI model, TCP/IP. *Compare* TCP.

**IP address** \I-P' a'dres, ə-dres'\ *n.* Short for **Internet Protocol address**. A 32-bit (4-byte) binary number that uniquely identifies a host (computer) connected to the Internet to other Internet hosts, for the purposes of communication through the transfer of packets. An IP address is expressed in "dotted quad" format, consisting of the decimal values of its 4 bytes, separated with periods; for example, 127.0.0.1. The first 1, 2, or 3 bytes of the IP address, assigned by InterNIC Registration Services, identify the network the host is connected to; the remaining bits identify the host itself. The 32 bits of all 4 bytes together can signify almost  $2^{32}$ , or roughly 4 billion, hosts. (A few small ranges within that set of numbers are not used.) *See also* host, InterNIC, IP, packet (definition 2). *Compare* domain name.

**IPC** \I-P-C'\ *n.* *See* interprocess communication.

**IPL** \I-P-L'\ *n.* *See* initial program load.

**IP multicasting** \I-P' mul'tē-kas'tēng, mul'tī-kas'tēng\ *n.* Short for **Internet Protocol multicasting**. The extension of local area network multicasting technology to a TCP/IP network. Hosts send and receive multicast datagrams, the destina-

tion fields of which specify IP host group addresses rather than individual IP addresses. A host indicates that it is a member of a group by means of the Internet Group Management Protocol. *See also* datagram, Internet Group Membership Protocol, IP, MBONE, multicasting.

**IPng** \I'pēng, I'P-N-G'\ Acronym for **Internet Protocol next generation**. A version of Internet Protocol (IP) developed by the Internet Engineering Task Force (IETF). Improvements over the original Internet Protocol include better security and an increased IP address size of 16 bytes. *See also* IETF, IP, IP address.

**IP spoofing** \I-P' spōō'fēng\ *n.* The act of inserting a false sender IP address into an Internet transmission in order to gain unauthorized access to a computer system. *See also* IP address, spoofing.

**IP switching** \I-P' swich'ēng\ *n.* A technology developed by Ipsilon Networks (Sunnyvale, Calif.) that enables a sequence of IP packets with a common destination to be transmitted over a high-speed, high-bandwidth Asynchronous Transfer Mode (ATM) connection.

**IPv6** \I'P-V-siks'\ *n.* Short for **Internet Protocol version 6**. A proposed next generation for the Internet Protocol, currently version 4, which was introduced in September 1995 by the Internet Engineering Task Force and formerly known as IPng. *See also* IP, IPng.

**IPX** \I'P-X'\ *n.* Acronym for **Internetwork Packet Exchange**. The protocol in Novell NetWare that governs addressing and routing of packets within and between LANs. IPX packets can be encapsulated in Ethernet packets or Token Ring frames. IPX operates at ISO/OSI levels 3 and 4 but does not perform all the functions at those levels. In particular, IPX does not guarantee that a message will be complete (no lost packets); SPX has that job. *See also* Ethernet (definition 1), packet, Token Ring network. *Compare* SPX (definition 1).

**IPX/SPX** \I'P-X-S'P-X'\ *n.* The network and transport level protocols used by Novell NetWare, which together correspond to the combination of TCP and IP in the TCP/IP protocol suite. *See also* IPX, SPX (definition 1).

**.iq** \dot'I-Q'\ *n.* On the Internet, the major geographic domain specifying that an address is located in Iraq.

defined area is always associated with a pre-defined on-screen position. *See also* relative coordinates, relative movement. *Compare* absolute pointing device.

**relative URL** \rel'ə-tiv U-R-L' *n.* Short for **relative uniform resource locator**. A form of URL in which the domain and some or all directory names are omitted, leaving only the document name and extension (and perhaps a partial list of directory names). The indicated file is found in a location relative to the pathname of the current document. *Acronym:* RELURL (R'E-L-U-R-L'). *See also* file extension, URL.

**relay** \rē'lā' *n.* A switch activated by an electrical signal. A relay allows another signal to be controlled without the need for human action to route the other signal to the control point, and it also allows a relatively low-power signal to control a high-power signal.

**release**<sup>1</sup> \rə-lēs' *n.* **1.** A particular version of a piece of software, most commonly associated with the most recent version (as in "the latest release"). Some companies use the term *release* as an integral part of the product name (as in *Lotus 1-2-3 Release 2.2*). **2.** A version of a product that is available in general distribution. *Compare* beta<sup>2</sup>.

**release**<sup>2</sup> \rə-lēs' *vb.* **1.** To relinquish control of a block of memory, a device, or another system resource to the operating system. **2.** To formally make a product available to the marketplace.

**reliability** \rə-lī'ə-bil'ə-tē' *n.* The likelihood of a computer system or device continuing to function over a given period of time and under specified conditions. Reliability is measured by different performance indexes. For example, the reliability of a hard disk is often given as mean time between failures (MTBF): the average length of time the disk can be expected to function without failing. *See also* MTBF, MTTR.

**reload** \rē-lōd' *vb.* **1.** To load a program into memory from a storage device again in order to run it, because the system has crashed or the program's operation was otherwise interrupted. **2.** To retrieve a new copy of the Web page currently visible in a Web browser.

**relocatable address** \rē-lō-kā'tə-bl a'dres, ə-dres' *n.* In programming, an address that is to be adjusted to reflect the actual place in memory into

which a program is loaded for execution. In "Get the byte located 12 bytes from this instruction," the address is relocatable; in "Get the byte located at address 255," the address is not relocatable. This convention is comparable to describing the "address" of a parked car as "level 2, row G" on one day and "level 5, row B" on another.

**relocatable code** \rē-lō-kā'tə-bl kōd' *n.* A program written in such a way that it can be loaded into any part of available memory rather than having to be placed in one specific location. In relocatable code, address references that depend on the program's physical location in memory are calculated at run time so that program instructions can be carried out correctly. *See also* reentrant code.

**relocate** \rē'lō-kāt' *n.* To move programs and blocks of memory about within available space so as to use memory resources flexibly and efficiently. A relocatable program can be loaded by the operating system into any part of available memory rather than into only one specific area. A relocatable block of memory is a portion of memory that can be moved around by the operating system as required; for example, the system might collect several available, relocatable blocks of memory to form one larger block of the size requested for use by a program.

**RELURL** \R'E-L-U-R-L' *n.* *See* relative URL.

**remark** \rə-märk' *n.* *See* comment, REM statement.

**remote** \rə-mōt' *adj.* Not in the immediate vicinity, as a computer or other device located in another place (room, building, or city) and accessible through some type of cable or communications link.

**remote access** \rə-mōt' ak'ses' *n.* The use of a remote computer.

**Remote Authentication Dial-In User Service** \rə-mōt' ä-then-tə-kā'shən dīl'in yōō zər sər'vəs, ô-then-tə-kā'shən' *n.* *See* RADIUS.

**remote access server** \rə-mōt' ak'ses sər'vər' *n.* A host on a local area network that is equipped with modems to enable users to connect to the network over telephone lines. *Acronym:* RAS (R'A-S').

**Remote Access Service** \rə-mōt' ak'ses sər'vis' *n.* Windows software that allows a user to gain



remote access to the network server via a modem.  
*Acronym:* RAS (R'A-S'). *See also* remote access.

**remote administration** \rə-mōt' əd-min-ə-strā'shən\ *n.* The performance of system administration-related tasks via access from another machine in a network.

**remote communications** \rə-mōt' kə-myōō-nā-kā'shənz\ *n.* Interaction with a remote computer through a telephone connection or another communications line.

**remote computer system** \rə-mōt' kəm-pyōō-tər si'stəm\ *n.* *See* remote system.

**Remote Data Objects** \rə-mōt' dā'tə ob'jekts, dat'ə\ *n.* An object-oriented data access tool featured in the Enterprise Edition of Visual Basic 4.0. Remote Data Objects have no native file format of their own; they can be used only with databases complying with the most recent ODBC standards. This feature is popular for its speed and minimal coding requirements. *Acronym:* RDO (R'D-O'). *See also* ODBC, Visual Basic.

**remote login** \rə-mōt' log'in, rē-mōt'\ *n.* The action of logging in to a computer at a distant location by means of a data communications connection with the computer that one is presently using. After remote login, the user's own computer behaves like a terminal connected to the remote system. On the Internet, remote login is done primarily by rlogin and telnet. *See also* rlogin<sup>1</sup> (definition 1), telnet<sup>1</sup>.

**remote procedure call** \rə-mōt' prə-sē'jur käl, rē-mōt'\ *n.* In programming, a call by one program to a second program on a remote system. The second program generally performs a task and returns the results of that task to the first program. *Acronym:* RPC (R'P-C').

**remote system** \rə-mōt' si'stəm, rē-mōt'\ *n.* The computer or network that a remote user is accessing via a modem. *See also* remote access. *Compare* remote terminal.

**remote terminal** \rə-mōt' tər'mə-nəl, rē-mōt'\ *n.* A terminal that is located at a site removed from the computer to which it is attached. Remote terminals rely on modems and telephone lines to communicate with the host computer. *See also* remote access. *Compare* remote system.

**removable disk** \rə-mōv'ə-bl disk'\ *n.* A disk that can be removed from a disk drive. Floppy

disks are removable; hard disks usually are not. *Also called* exchangeable disk.

**REM statement** \rem' stāt'mənt\ *n.* Short for **remark statement**. A statement in the Basic programming language and the MS-DOS and OS/2 batch file languages that is used to add comments to a program or batch file. Any statement beginning with the word *REM* is ignored by the interpreter or compiler or the command processor. *See also* comment.

**rename** \rē-nām'\ *n.* A command in most file transfer protocol (FTP) clients and in many other systems that allows the user to assign a new name to a file or files.

**render** \ren'dər\ *vb.* To produce a graphic image from a data file on an output device such as a video display or printer.

**rendering** \ren'dər-ēng\ *n.* The creation of an image containing geometric models, using color and shading to give the image a realistic look. Usually part of a geometric modeling package such as a CAD program, rendering uses mathematics to describe the location of a light source in relation to the object and to calculate the way in which the light would create highlights, shading, and variations in color. Realism can range from opaque, shaded polygons to images approximating photographs in their complexity. *See also* ray tracing.

**repaginate** \rē'paj'ə-nāt\ *vb.* To recalculate the page breaks in a document.

**Repeat** \rə-pēt'\ *n.* A command in Microsoft Word that causes all information contained in either the last command dialog box or the last uninterrupted editing session to be repeated.

**repeat counter** \rə-pēt' koun'tər\ *n.* A loop counter; typically, a register that holds a number representing how many times a repetitive process has been or is to be executed.

**repeater** \rə-pē'tər'\ *n.* A device used on communications circuits that decreases distortion by amplifying or regenerating a signal so that it can be transmitted onward in its original strength and form. On a network, a repeater connects two networks or two network segments at the physical layer of the ISO/OSI model and regenerates the signal.

**repeating Ethernet** \rə-pē'tēng ē'tər-net\ *n.* *See* repeater.





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